

Chapter 2 Genetics



It's a beautiful fall day, and the young family in the photograph is getting ready to join their extended families for a big barbecue. For the girl, Roxanne, the barbecue will top off a near-perfect day at her grandparent's place where she got to play with her cousins and explore the farm. All day long Roxanne heard from different relatives about how much she is like her mother or how similar she is to her father. In terms of her physical traits, if you look closely at the photograph, you can see that Roxanne inherited some features from her mother and some from her father. The colour of Roxanne's hair and skin seem to be inherited from her father, while the colour and shape of her eyes are attributable to her mother.

How is it determined what traits are inherited from each parent? Is it true that some traits from one parent are “overpowered” by traits from the other parent? Does chance play a role in determining which traits are passed on?

Physical traits and many other characteristics are passed on from parents to offspring as information encoded in long molecules within cells. Genetics is the study of information and instructions inside cells. A greater understanding of how these genetic instructions are written and inherited by offspring has been applied to help solve crimes, understand diseases, make new medicines, and even re-design living organisms.

By the end of Chapter 2 you will have studied some history and major principles behind the science of genetics. You will not only have looked at how some genetic diseases can arise from inherited traits, but you will have examined the effect of genetic mutations. Throughout the chapter you will look at some ethical considerations of genetics by assessing the risks and benefits of using several genetic technologies.



Try This Activity

Tongue Rolling

A combination of different physical characteristics makes each person unique. Many physical differences—such as the colour of eyes, hair, and skin—are due to slight differences in the genetic information that each individual received from his or her biological parents. One characteristic determined by your genetic information is the ability to roll your tongue. Your teacher will ask you and class members to each try to roll your tongues like the person in the photograph.

Discussion

1. Were you able to roll your tongue?
2. Are more people in your class tongue rollers or non-tongue rollers? Which is the most common characteristic?
3. Do you think that if a non-tongue roller practised a lot, this person could roll his or her tongue?
4. Why do you think some people are able to roll their tongues and others are not? Is there a benefit to being able to roll your tongue?
5. Speculate about the answers to the following questions.
 - a. Can a child have the ability to roll her tongue even if neither biological parent is able to?
 - b. Could two tongue-rolling parents have a non-tongue rolling child?

You will have an opportunity to move from speculation to writing well-explained answers when you return to some of these questions later in Chapter 2.

